the lower surface are slightly larger and measure 200-260µm (when ectosomal spiculation preserved) and corresponding canal openings in the choanosomal skeleton are 230-280µm. Ectosomal spicules are tangentially arranged amphioxeas. No other structures are present on the surface of the choanosomal skeleton beyond these canal openings that lead to ostia and oscula. On the surface of the margin slightly sinuous and partly open canals, 0.20-0.25mm wide, run close to the surface of the skeleton from the lower to the upper surface of the sponge. Similar canals pierce the wall in cross section. Close to the outer (lower) surface of the choanosomal skeleton there are numerous large connected lacunes 0.4-0.5mm diameter. In cross section are also visible bundles of oxeas that protrude from the conules on the surface and enter deeply into the choanosomal skeleton.

Colour. White or yellow when dry or in alcohol, white when devoid of ectosomal spicules.

Desmas. These are strongly branched and thorny rhizoclones measuring 200-400µm long; rhizoclones around canals are only tuberculated on the canal side.

Other megascleres. Large oxeas protrude from conules on both surfaces (but are more developed on the upper one) and deep in the choanosome. They are invariably broken so total length is unknown but they are at least 1cm long and 15-23µm thick. Ectosomal spicules are tangentially arranged, smooth, regular amphioxeas that are 120-210µm long and 10-14µm thick. They show all transitions to desmas. Derivatives with shapes modified toward rhizoclone desmas may be 270µm long and 40µm thick or more. Ectosomal spicules may be concentrically arranged around oscula.

Small oxeas protect ostia on the lower surface forming tepee-like structures around the ostia. These spicules are usually broken but they appear to be 300-500µm long and 3.5-5µm diameter.

Microscleres. Thorny sigmaspires measure 8-13µm long and up to 1.7µm thick.

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AN UNUSUAL SUBERITID DEMOSPONGE FROM A MARINE ALKALINE CRATER LAKE (SATONDA ISLAND, INDONESIA). *Memoirs of the Queensland Museum 44: 477-478. 1999*:- To date, the Satonda crater lake, Indonesia, is the only 'marine' lake known to have an increased alkalinity compared to seawater (Kempe & Kazmierczak, 1990, 1993; Kempe et al., 1997). The lake was originally filled with freshwater, as evidenced by the presence of fossil peat deposits (3,150 ^{14}C-yrs BP). Later, the lake was rapidly filled with seawater, as indicated by the settlement of a marine fauna. Today the lake is divided into three water bodies with differing salinities, separated by two pycnoclines (Kempe & Kazmierczak, 1990, 1993; Kempe et al., 1997). Both bottom water layers are anaerobic due to intensive oxygen consuming bacterial decomposition processes, linked to the large input of organic matter from the surrounding vegetation. As a result, an intense sulfate reduction occurs in both bottom water bodies, producing high amounts of bicarbonate ions. As a result of seasonal mixings events, waters from the upper layers of these high-alkalinity bottom waters are transferred to the well oxygenated mixolimnion, causing a slight rise in alkalinity to 4-5 meq/l in the brackish (32 ‰ salinity) surface waters ('alkalinity pump'; Kempe, 1990; Kempe & Kazmierczak, 1993; Kempe et al., 1997). The pH values of mixolimnion waters range between 8.3-8.6. As a consequence of raised carbonate alkalinities, the lake generally contains a decreased amount of Ca^{2+}.

(Cont. over)

The red-algal-microbialite reefs exhibit a vertical development which started with a serpulid framework, followed by microstromatolites encrusting former green algal filaments, and loose crusts largely composed of the aragonitic squamariacean red alga *Peyssonnelia* (Kempe & Kazmierczak, 1990, 1993; Kempe et al., 1997). The uppermost calcareous crust is formed by a framework of *Lithoporella*, *Peyssonnelia* and intercalated micrite layers of presumed microbial origin. The living reef community is located on top of this layer. The special hydrochemical situation might be responsible for the very specific and endemic development of the biota. Cyanobacteria and heterotrophic microbes exhibit large diversities in contrast to just one sponge taxon (*Laxosuberites* n. sp.). Common are cyanobacteria of the morphological taxa *Phormidium*, *Calothrix*, *Pleurocapsa*, *Hyella*, and *Spirulina*, in addition to unidentified taxa (Arp et al., 1996)

The steep slopes of the red algae reefs are entirely covered by a dense curtain of *Cladophora* tufts extending to 15-16m depth. Sponges grow underneath this curtain, where light regimes are between 200-300lux. In 1993, the depth limit of sponges was recorded at 20m, i.e. slightly above the upper pycnocline. The sponge fauna is represented by different morphotypes of the hadromerid taxon *Suberites*, which is characterized by tylostyle megascleres only. The dermal layer of the sponge is constructed of plumose bundles of short tylostyles (150-200µm long), the choanosomal spicules are randomly orientated and much larger than the dermal ones (300-500µm). Most of the sponges observed exhibit a lateral, encrusting growth habit and therefore show a well developed exhalant canal system. The exhalant system is differentiated into star-shaped units ('astrorhizae'-pattern). In each unit the main exhalant canals conjugate in one large osculum. A second sponge morphotype exhibits a more-or-less erect growth habit and does not show any star-shaped outer exhalant system. This sponge forms tubes with a central osculum, reminiscent of *Polymastia* and which is phylogenetically closely related to *Suberites*. The new species is referred to *Laxosuberites*, based on its spicule inventory, geometry and arrangement. This species shows many color variations: from dark green, brown, yellow/brown to yellow. Different colors are related to microorganisms within the soft tissue. The dark green color is restricted to specimens in extremely shallow water (20-50cm depth), produced by living unicellular green algae enclosed within the mesohyle of the sponge. These algae are part of the plankton and filtered by the sponge. The brownish color variation is restricted to few specimens from deeper water (18-20m depth), with coloration related to the presence of large populations of a still-unidentified mesohyle bacterium. The presumably symbiotic, native bacterial flora of the sponge is rare and very small (less then 1µm – 'nanobacteria'). The size and abundance of these bacteria are comparable to those observed in the marine hadromerid coralline sponge *Acanthochaetetes*. In many cases the encrusting sponges form very thin films (ca. 50µm thick), growing within interspaces of dead red algal knobbs. The sponges occupy large spaces between the dead portions of the algal reef surface. Apparently, they prefer light protected areas, except for the algaebearing specimens.

Theoretically these sponges are particle feeders. Within vacuoles of archaeocytes, for example, the remains of diatoms were observed. However, the sponges also have abundant ostia in their basopinacoderm, that is, in all observed cases, growing on active heterotrophic biofilms. This may suggest a close relationship between the biofilms and the sponge. We assume that the biofilms release metabolic products consumed by the sponge. This behavior may also explain the enormous lateral growth of thin sponge sheets. Of further significance is the ability of these sponges to build resting bodies, which are located in small protected cryptic niches between coralline algae or in small caverns 200-500µm diameter. The resting bodies are hemispherical or sack-shaped, and filled with archaeocytes/ thesocytes.The sponge fauna seems perfectly adapted to this extreme environment. Pending additional ultrastructural studies, we assume that these sponges are new and restricted to this special environment. ❒ *Porifera, suberitids, alkaline crater lake, Indonesia.*

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